

## **Historic, archived document**

Do not assume content reflects current scientific knowledge, policies, or practices.

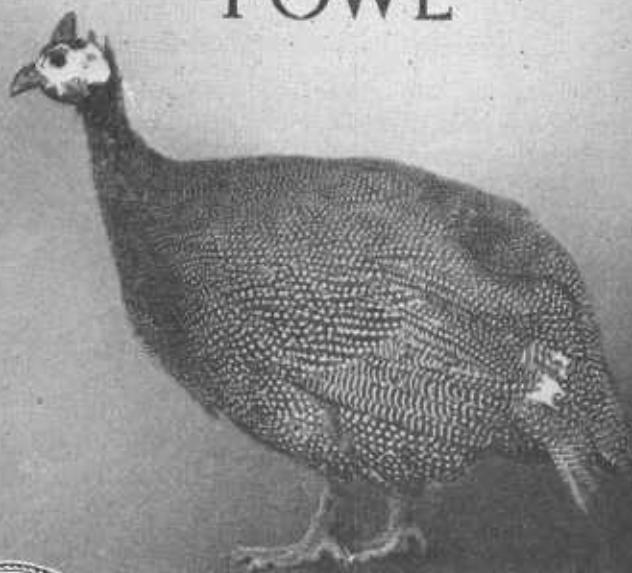
LIBRARY  
RECEIVED

★ DEC 14 1928 ★  
U. S. Department of Agriculture

U. S. DEPARTMENT OF  
AGRICULTURE

FARMERS' BULLETIN No. 1391

*The*  
GUINEA  
FOWL



1928

**G**UINEA FOWL are growing in favor as a substitute for game birds, with the result that guinea raising is becoming more profitable.

They are raised usually in small flocks on general farms, and need a large range for best results.

Domesticated guinea fowl are of three varieties, Pearl, White, and Lavender, of which the Pearl is by far the most popular.

Guinea fowl have a tendency to mate in pairs, but one male may be mated successfully with three or four females.

Guinea hens usually begin to lay in April or May, and will lay 20 to 30 eggs before becoming broody. If not allowed to sit they will continue to lay throughout the summer, laying from 40 to 60 or more eggs.

Eggs may be removed from the nest when the guinea hen is not sitting, but two or more eggs should be left in the nest.

Ordinary hens are used commonly to hatch and rear guinea chicks, but guinea hens and turkey hens also may be employed successfully, although they are more difficult to manage.

Guineas are marketed late in the summer, when they weigh from 1 to 1½ pounds at about 2½ months of age, and also throughout the fall, when the demand is for heavier birds.

This bulletin is a revision of and supersedes Farmers' Bulletin 858.

# THE GUINEA FOWL.

By ANDREW S. WEIANT,<sup>1</sup> *Formerly Scientific Assistant in Poultry Investigations,  
Animal Husbandry Division, Bureau of Animal Industry.*

## CONTENTS.

	Page.		Page.
Demand for guinea fowl in the United States-----	1	Guinea eggs-----	6
Price of guinea fowl-----	2	Incubation-----	8
Breeding stock and eggs for hatching-----	2	Artificial incubation and brooding--	9
Varieties of guinea fowl-----	2	Natural brooding of guinea chicks--	9
Distinguishing sex-----	4	Feeding-----	10
Breeding-----	5	Roosting-----	11
		Marketing-----	11

## DEMAND FOR GUINEA FOWL IN THE UNITED STATES.

THE value of the guinea fowl as a substitute for game birds such as grouse, partridge, quail, and pheasant is becoming more and more recognized by those who are fond of this class of meat and the demand for these fowls is increasing steadily. Many hotels and restaurants in the large cities serve prime young guineas at banquets and club dinners as a special delicacy. When well cooked, guineas are attractive in appearance, although darker than common fowls, and the flesh of young birds is tender and of especially fine flavor, resembling that of wild game. Like all other fowl, old guineas are very likely to be tough and rather dry.

A few of the large poultry raisers, particularly those who are within easy reach of the large eastern markets, make a practice of raising a hundred or so guineas each year, but the great majority of guineas are raised in small flocks of from 10 to 25 upon farms in the Middle West and in the South. Many farmers keep a pair or a trio of guineas more as a novelty than for profit, and from these a small flock is raised. The guinea fowl doubtless would be more popular on farms were it not for its harsh and at times seemingly never-ending cry. However, some people consider this cry an argument in the guinea's favor, as it gives warning of marauders in the poultry yard. Similarly, their pugnacious disposition, while sometimes causing disturbances among the other poultry, also makes them show fight against hawks and other common enemies, so that guineas sometimes are kept as guards over the poultry yard. Often a few guineas are raised with a flock of turkeys and allowed to roost in the same tree, where they can give warning if any theft is attempted during the night.

<sup>1</sup> Mr. Weiانت resigned Feb. 28, 1918. This bulletin was revised by Alfred R. Lee, Associate Poultry Husbandman, Animal Husbandry Division.

The total number of guinea fowl in this country is comparatively small, the number on farms in 1920, according to the census figures, being 2,410,421. This number is slightly less than the number of either ducks or geese, about two-thirds the number of turkeys, and a very small percentage of the number of chickens. The census figures show an increase of 36 per cent in the number of guinea fowl on farms in 1920 over the number in 1910. Texas showed the largest number, followed by Pennsylvania, Georgia, Alabama, South Carolina, Illinois, Oklahoma, and Missouri.

### PRICE OF GUINEA FOWL.

The highest prices for guinea fowl are paid in the large eastern markets. Guinea raisers who are near these markets, or who have developed a trade among private customers, receive prices that make this industry profitable. Wholesale prices in Washington, D. C., range from 90 cents to \$1.25 a piece for dressed spring guineas; in New York they usually range from \$1.25 to \$2.25 per pair. When marketed early in the fall, the smaller sizes bring about the same price a piece as those that are held until they are larger and marketed in November and December. Old guineas are not in demand and seldom bring more than 75 cents to \$1 a pair.

In the city markets of the Middle West and South the demand for guinea fowl is small, and the prices are correspondingly low. Young guinea fowl, locally called "keats," retail in Washington, D. C., at about \$1.25 each, the price remaining very steady throughout the fall and winter. On the Pacific coast very few guineas are raised and only occasionally can they be found even in the largest markets.

### BREEDING STOCK AND EGGS FOR HATCHING.

There is a fair demand for guinea fowls as breeding stock, most of them being sold in pairs and trios. Breeders of the purebred Pearl, White, or Lavender varieties who have a reputation for high-class birds usually have little difficulty in disposing of surplus stock at prices ranging from \$2.50 to \$3.50 a pair and from \$3.50 to \$5.50 a trio. The demand for eggs for hatching is usually greater than for breeding stock. The sale both of guinea fowl for breeding purposes and of hatching eggs is very limited compared with that of other kinds of poultry. Very few breeders of guineas advertise their stock. From \$1 to \$1.50 for 15 eggs from purebred birds is an ordinary price. During the last few years a limited market for guinea eggs has developed among the commercial hatcheries which have an outlet for guinea chicks along with their ordinary chicks, ducklings, goslings, and turkey poults.

### VARIETIES OF GUINEA FOWL.

Several species of wild birds known as guinea fowl are found in Africa, and derive their name from Guinea, which is situated on the West Coast of that continent. From one of these wild species

(*Numida meleagris*) the common domesticated guineas are descended. They have long been domesticated, having been raised as table birds by the ancient Greeks and Romans, and were introduced into this country by the early settlers. In Africa, where there are still many wild flocks, they are highly prized by hunters as game birds, and in England they sometimes are used to stock game preserves. Even in this country a few flocks left to shift for themselves have become so wild as to afford excellent hunting.

Domesticated guinea fowl are of three varieties—Pearl, White, and Lavender. The Pearl is by far the most popular. It has a

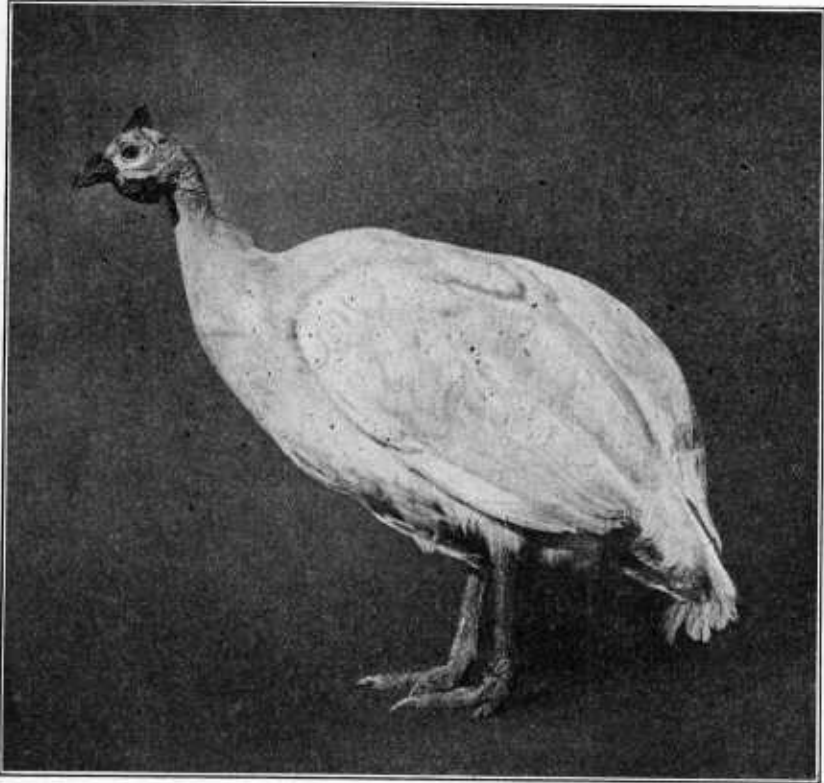


FIG. 1.—White guinea, male.

purplish-gray plumage regularly dotted or “pearled” with white and is so handsome that frequently the feathers are used for ornamental purposes. The illustration on the front page shows a male of this variety. The White guinea fowl (fig. 1) is of pure-white plumage, and the skin is somewhat lighter in color than in the Pearl variety. Lavender guineas resemble those of the Pearl variety, except that the plumage is of a light gray or lavender, regularly dotted with white instead of a dark or purplish gray dotted with white. (see fig 2.) By crossing the Pearl or Lavender varieties with the White, what is known as the “Splashed” guinea is produced, the breast and flight feathers being white and the remainder of the

plumage being Pearl or Lavender. Crosses between guinea fowl and other poultry, particularly chickens and less commonly turkeys, are not unknown, but such birds without exception are sterile.

The young guinea chicks are very attractive, those of the Pearl variety resembling young quail. They are brown in color, the under part of the body being lighter than the rest, while the beak and legs are red. The first feathers are brown, but these are replaced gradually by the "pearled" feathers until at about 2 months of age the brown feathers have disappeared completely. About this time also the wattles and helmet begin to make an appearance.

As yet no standard of perfection has been set for guinea fowl, the birds not being recognized by the American Poultry Association. They are exhibited at poultry shows throughout the country, however, and most of these shows offer prizes for the best birds. In

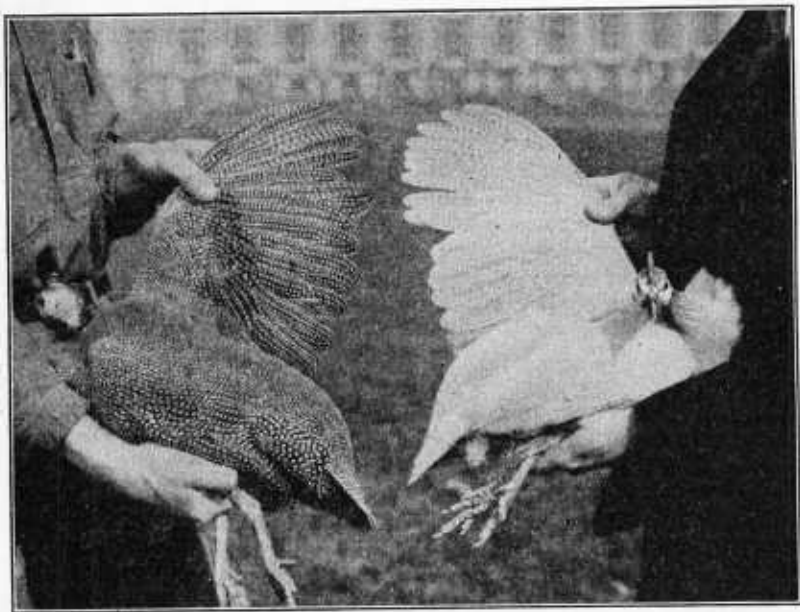


FIG. 2.—The color of the plumage of the Pearl guinea (left) is purplish gray and the Lavender (right) is light gray. Both varieties are regularly dotted with white.

judging guinea fowl, the points regarded as most important are of good size and uniform color. White flight feathers in the Pearl and Lavender varieties are the most common defects. In weight, guineas average from 3 to 4 pounds at maturity for both male and female.

### DISTINGUISHING SEX.

The male and the female guinea fowl differ so little in appearance that many persons have considerable difficulty in making a distinction. Indeed, it often happens that those who are inexperienced in raising these fowl will unknowingly keep all males or all females as breeding stock. Usually the males can be distinguished by their larger helmet and wattles and coarser head (fig. 3), but to be positive one should listen to the cry made by each bird. That of the

female resembles "buckwheat, buckwheat," and is decidedly different from the one-syllable shriek of the male. When excited, both the male and the female emit one-syllable cries, but at no time does the male imitate the cry of "buckwheat, buckwheat." Sex can be distinguished by this difference in the cry of the male and female at any time after the birds are about 2 months old.

#### BREEDING.

Like quail and most other wild birds, guinea fowls in their wild state mate in pairs, and this tendency prevails among domesticated guineas also, provided the males and females are equal in number. As the breeding season approaches, one pair after another separates

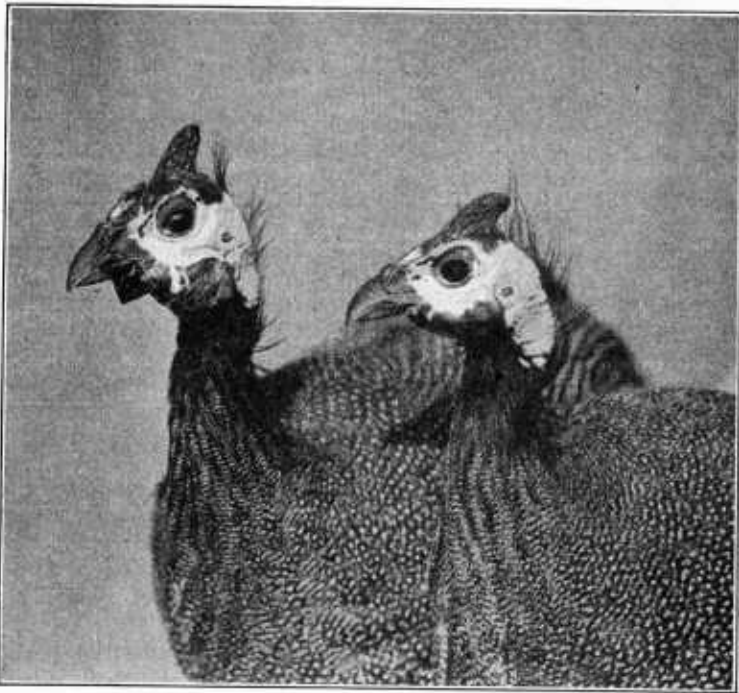


FIG. 3.—Distinguishing between male and female. The helmet and wattles of the male (left) are larger than those of the female.

from the remainder of the flock and ranges off in the fields in search of a suitable nesting place. Once mated in this way, the male usually remains with his mate throughout the laying season, standing guard somewhere near the nest while the hen is laying and ready to warn her of any approaching danger. However, it is not necessary to mate them in pairs under domestic conditions to secure fertile eggs, and most breeders keep but one male for every three or four females. When mated in this way the hens are more apt to lay near home and several usually lay in the same nest, thus making it much easier to find the nests and gather the eggs.

Most guinea raisers allow their breeding stock free range of the entire farm at all times, and this helps to keep the birds strong and



vigorous. During the winter the breeders should be fed a grain mixture of corn, wheat, and oats twice a day, and where no green feed is available on the range at this time of the year, vegetables, such as potatoes, turnips, beets, and cabbage, should be substituted. Animal feed is essential to best results and can be supplied by feeding meat scrap or skimmed milk. Given free range, where the supply of natural feed during the winter and early spring is ample, as it usually is in the southern portion of the United States, the



FIG. 4.—Proper way to carry a guinea fowl.

guineas can be left to pick up a considerable part of their feed. Free access to grit, charcoal, and oyster shell is necessary throughout the breeding and laying season. Avoid having the breeders too fat, but keep them in good firm flesh.

Guinea fowl are kept in best breeding condition on free range. Under many conditions it is not practical to allow the birds free range and they may be raised successfully confined to yards. Guinea fowl are very difficult to confine unless their wings are pinioned or clipped. Birds on range may also be treated in this manner. Guinea chicks may be pinioned, after they are 1 or 2 weeks old, by snipping off the last joint of their wing and dipping the stump in tannic acid. It is more difficult to pinion adult birds and the wing must be tied

up to prevent excessive bleeding. Another method of treating adult stock is to clip their flight feathers every year.

### GUINEA EGGS.

As profitable egg producers guinea hens can not compete with ordinary hens, but during the latter part of the spring and throughout the summer they are persistent layers. The eggs are smaller than hen eggs, weighing about 1.4 ounces each, while eggs of the common

fowl average about 2 ounces each (see fig. 5); consequently guinea eggs sell at a somewhat lower price. There is no special market for guinea eggs. They are usually graded by dealers as small eggs. Owing to the natural tendency of the guinea hen to nest in a patch of weeds or some other well-hidden place, many of the eggs are not found until they are no longer fit for market. The shells of guinea eggs are so thick and often so dark that it is difficult to test them by candling, and for this reason, and also because the eggs are small, dealers do not like to handle them. For home use, however, guinea eggs can be made to take the place of hen eggs, and many regard them as superior in flavor. In composition the greatest difference is that the shell is thicker and the yolk makes up a slightly larger proportion of the total egg contents than in the case of hen eggs.

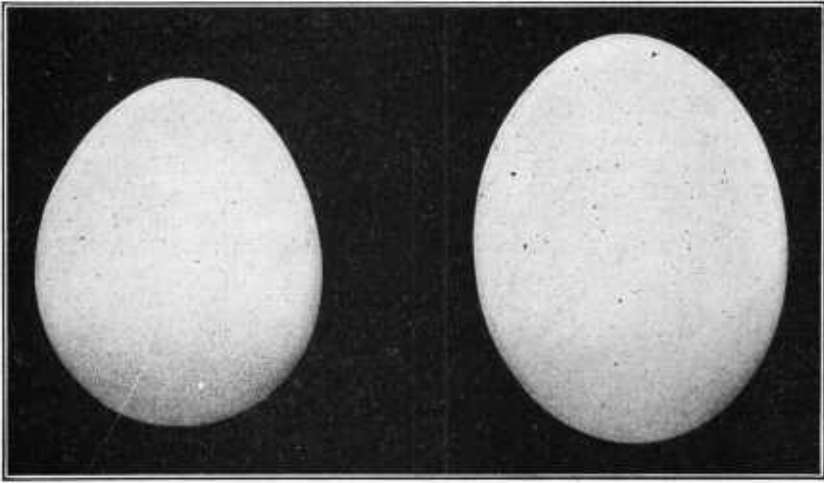


FIG. 5.—Relative size of eggs of guinea hen (left) and ordinary hen (right).

#### LAYING.

Guinea hens usually begin laying in April or May, those in the South laying earlier than those in the North. A short time before the opening of the laying period the hens with their mates begin searching for suitable nesting places among the weeds and brush along the fences or in the fields. In this search the male takes as active an interest as his mate, and when a suitable location is found both help to dig out the nest and make it into a suitable shape. Each day as the hen goes to the nest to lay the male accompanies her and remains near by until she comes off. Should anyone approach he shrieks in warning and thus betrays the whereabouts of the nest, which might otherwise be difficult to locate. If several guinea hens are mated with one male they usually all lay in the same nest, but sometimes a hen after mating will wander off by herself to make her own nest. At other times the male bird, after helping one hen to make her nest, will then desert her and pair off with another hen to make another nest.

From 20 to 30 and often more eggs are laid before the guinea hen becomes broody, at which time she can be broken of her broodiness

easily by removing the eggs from her nest, when she will soon begin laying again. If not allowed to sit, guinea hens will continue to lay throughout the summer, laying from 40 to 60 and in some cases 100 eggs during the season.

#### GATHERING THE EGGS.

The wild nature of the guinea hen asserts itself in her nesting habits. Instinct demands that the nest be well hidden from all enemies, such as crows, dogs, skunks, opossums, rats, foxes, coyotes, and other predatory animals. If the hen becomes frightened by the intrusion of some enemy, or if her eggs are removed from the nest, more than likely she will change her nesting place to a safer location. For this reason she should not be disturbed while she is on the nest, and the eggs should not be removed without leaving a few nest eggs in their place. If a number of eggs are removed at one time, half a dozen left in the nest usually are sufficient to keep the hen from seeking a new nest. If the eggs are gathered every day, two or three usually are enough to leave as nest eggs. It is unnecessary to remove the eggs with a spoon or to scrape them out with a stick, as is sometimes done to prevent the hand from coming in contact with the nest and leaving a scent. After the eggs are gathered they should be handled with as little jarring as possible and should be set while fresh, never holding them more than two weeks if it can be avoided.

#### INCUBATION.

Ordinary hens are used commonly to incubate guinea eggs, but guinea hens, turkey hens, and incubators also can be employed successfully. The usual sitting for a guinea hen is about 14 eggs, for a hen of one of the general purpose breeds such as a Plymouth Rock, 18 eggs, and for a turkey hen, about 24 eggs. The incubation period for guinea eggs is 28 days, although frequently they start hatching on the twenty-sixth day and are all hatched by the end of the twenty-seventh day.

If the nest in which the guinea hen becomes broody is safe from any disturbance, she may be trusted with a sitting of eggs and more than likely will hatch out every egg that is fertile, provided all hatch at about the same time. As soon as the guinea chicks begin to leave the nest the hen will leave with them, and any eggs that are late in hatching are ruined unless they are placed in an incubator or under a broody hen before they become chilled. Guinea hens usually are too wild to be set anywhere except in the nest where they have become broody, and often such a nest is unsafe. Because of these disadvantages and the fact that guinea hens do not make the most satisfactory mothers for guinea chicks, ordinary hens are most often used to do both the incubating and the brooding, at least until late in the summer, when the guinea hens often are allowed to sit and raise a brood without much attention being given them. Broody turkey hens, when not needed to incubate turkey eggs, often receive a sitting of guinea eggs, and they hatch them quite as well as ordinary hens and also are able to cover more eggs.

## ARTIFICIAL INCUBATION AND BROODING.

Incubators are used as successfully in hatching guinea eggs as in hatching hen eggs. They are operated in exactly the same way for either kind, except that the thermometer is lowered sufficiently to make its relative position above the guinea eggs similar to its former position above the hen eggs.

Very little has been done in the artificial brooding of guinea chicks. They are naturally of a wild nature and develop best on free range. It is possible to raise them successfully by artificial methods provided good methods are used and care is taken to keep them on clean ground. Careful sanitation is extremely important where artificial methods of rearing are used and the guinea chicks are kept under more or less confined conditions.

## NATURAL BROODING OF GUINEA CHICKS.

Ordinary hens make the best mothers for guinea chicks. Given warm, dry weather and plenty of range, turkey and guinea hens can be used successfully, but should a rain or heavy dew occur, the mother turkey or guinea hen is apt to drag the chicks through the wet grass, and many are lost from becoming wet and chilled. Neither turkey nor guinea hens can be induced to seek the shelter of a coop at night and during storms, but will remain out in the fields to hover their broods wherever they happen to be when nightfall overtakes them. When the guineas are old enough to roost they can be trained to roost wherever desired by driving them to the roosting place and feeding them there regularly. After the first few nights they will come to the place themselves, but until they are old enough to roost many of the young guineas that are being raised with turkey or guinea hens are likely to be killed by exposure to cold and dampness or by being led over so wild a range that they become exhausted and are unable to keep up with the remainder of the flock.

If ordinary hens are used as mothers, it is very easy to raise a large percentage of the total number of guinea chicks hatched. Each hen that is to have a brood should be allowed to hatch out some of the eggs herself, after which she will mother all that are given her. A Plymouth Rock hen can care for 18 easily. After the hatch is completed and the chicks are strong enough to leave the nest, the hen and brood are ready to be removed to the coop provided for them. The greatest fault of the hen as a mother is that on the average farm she has become accustomed to staying about the barnyard, and if allowed to do so she will keep her guinea chicks there also. Conditions about the barnyard are entirely unsuited for raising guineas, and to prevent the hen from keeping them there the coop should be placed in a distant pasture or field. Here the hen should be induced to remain until the guineas are old enough to go to roost.

For the first two days the hen should be confined to the coop, allowing the chicks to run in and out at will. They will not stay away unless there is another brood near by which they are apt to join. After the first few days the chicks become so attached to their foster mother that they will never leave her. By the third day the hen will have recognized the coop as her home and can have free range without fear of her wandering far away. At night she will return to the coop with her brood and can be shut in to protect her from foxes or any other night prowlers. After the dew is off the grass in the morning the coop can be opened and the hen and her brood allowed free range again. Should a rain come up they can easily be driven to the coop and the chicks will be kept warm and dry. The coop should be rain-proof and built without a floor. If it is moved a short distance every day, the ground beneath it is kept fresh and clean.

#### LICE.

Hens to be used in brooding guinea chicks should first be completely freed from lice. This can be done by applying sodium fluorid,<sup>2</sup> which can be obtained at most large drug stores, to the hens at the time they are set. Use small pinches of this powder among the feathers next to the skin—one pinch on the head, one on the neck, two on the back, one on the breast, one below the vent, one at the base of the tail, one on each thigh, and one scattered on the underside of each wing when spread. Guineas are less likely to have lice than common fowl, but when they are raised with hens care should be taken to keep them from becoming infested. Examine the young chicks about the head and along the wing bar at the base of the quill feathers, and if lice are found grease these parts lightly with lard. As the guineas grow older they take great delight in dusting themselves and usually are able to keep free from lice.

#### FEEDING.

Guineas are fed in much the same way as chickens, but they require less feed, as they are natural rangers and can be trusted to find enough seeds of weeds and grasses, buds, insects, and green vegetation in the fields to supply much of their living. For the first 36 hours after hatching no feed is required, as the sustenance from the egg is sufficient to nourish them for this period. The first meal may consist of a little hard-boiled egg mixed with bread crumbs, or bread may be soaked in milk, squeezed partly dry, and fed in small bits. Clabbered milk also is very good. Three times a day is as often as they need to be fed, one feed consisting of clabbered milk or the bread and egg or bread and milk mixture, and the other two of chick feed. If the coop is placed in a field or pasture where green feed is available, the guinea chicks can secure this for themselves; otherwise sprouted oats, dandelion leaves, lettuce, or onion tops cut fine should be furnished. Water, grit, and fine oyster shell should be before them always.

---

<sup>2</sup> See Farmers' Bulletin 801, "Mites and Lice on Poultry."

By the end of the first week the young guineas will be finding enough worms and insects to take the place of the egg or milk feed, so this may be eliminated and chick feed given morning and night. If clabbered milk is available, however, it can be continued with excellent success, since guineas are very fond of variety in their ration and it is conducive to quick growth. As the birds grow older, whole wheat, oats, and cracked corn can be substituted gradually for the chick feed.

### ROOSTING.

When guinea fowl are from 6 to 8 weeks old they will leave their coop and start roosting in some near-by tree or other roost that may be provided for them. They prefer roosting in the open, but if they have been raised with a hen they can be induced to follow her inside a poultry house and roost there. It is advisable to have them become accustomed to going into a house or shed of some sort, for otherwise it is almost impossible to catch them when they are wanted for the market. Guineaes, even after they are grown, will not allow the mother hen to leave. When she goes to her nest to lay, they follow and wait near by until she is ready to leave again. This attachment affords an easy method of controlling the natural wild instincts of the guinea fowl and makes raising them under domestic conditions much simpler.

### MARKETING.

The marketing season for guinea fowl is during the latter part of the summer and throughout the fall. At this time the demand in the city markets is for young birds weighing from 1 to 2 pounds each. At about 2½ months of age guineas weigh from 1 to 1½ pounds, and at this size they begin reaching the markets in August. As the season advances the demand is for heavier birds. During the fall and winter of 1927-28 New York quotations for dressed spring guineas were as follows, per pair:

Sept. 1	-----	\$1.25 to \$2.25
Oct. 1	-----	1.25 to 2.25
Dec. 1	-----	1.50 to 2.00
Feb. 1	-----	1.50 to 2.25
Apr. 1	-----	1.50 to 2.25

The usual practice in marketing game birds is to place them on the market unplucked, and in some markets guineas are sold in this way. (Fig. 6.) They look attractive with the feathers on, but the present tendency is to market most guineas with the feathers removed. For all retail as well as hotel and restaurant trade guineas should be dressed in the same way as common fowl. Before shipping any birds to a market it is advisable to inquire of the dealer to whom they are to be shipped whether the feathers should be removed.

If the guineas are to be marketed with the feathers on, all that should be done is to bleed them by severing the vein in the roof of

the mouth, allowing them to hang head downward until bleeding is complete. If the feathers are to be removed, this should be done by dry picking. The vein in the roof of the mouth is severed first to



FIG. 6.—Guinea fowl may be sent to market and displayed either with their feathers on or off, but the present tendency is to market guineas plucked.

insure thorough bleeding, and the knife then thrust through the groove in the roof of the mouth into the brain. When the brain is pierced the feathers are loosened by a convulsive movement of the muscles and can be removed easily.

# **ORGANIZATION OF THE UNITED STATES DEPARTMENT OF AGRICULTURE**

October 5, 1928

<i>Secretary of Agriculture</i> .....	W. M. JARDINE.
<i>Assistant Secretary</i> .....	R. W. DUNLAP.
<i>Director of Scientific Work</i> .....	A. F. WOODS.
<i>Director of Regulatory Work</i> .....	WALTER G. CAMPBELL.
<i>Director of Extension</i> .....	C. W. WARBURTON.
<i>Director of Personnel and Business Administration</i> .....	W. W. STOCKBERGER.
<i>Director of Information</i> .....	NELSON ANTRIM CRAWFORD.
<i>Solicitor</i> .....	R. W. WILLIAMS.
<i>Weather Bureau</i> .....	CHARLES F. MARVIN, <i>Chief</i> .
<i>Bureau of Animal Industry</i> .....	JOHN R. MOHLER, <i>Chief</i> .
<i>Bureau of Dairy Industry</i> .....	O. E. REED, <i>Chief</i> .
<i>Bureau of Plant Industry</i> .....	WILLIAM A. TAYLOR, <i>Chief</i> .
<i>Forest Service</i> .....	R. Y. STUART, <i>Chief</i> .
<i>Bureau of Chemistry and Soils</i> .....	H. G. KNIGHT, <i>Chief</i> .
<i>Bureau of Entomology</i> .....	C. L. MARLATT, <i>Chief</i> .
<i>Bureau of Biological Survey</i> .....	PAUL G. REDINGTON, <i>Chief</i> .
<i>Bureau of Public Roads</i> .....	THOMAS H. MACDONALD, <i>Chief</i> .
<i>Bureau of Agricultural Economics</i> .....	NILS A. OLSEN, <i>Chief</i> .
<i>Bureau of Home Economics</i> .....	LOUISE STANLEY, <i>Chief</i> .
<i>Plant Quarantine and Control Administration</i> .....	C. L. MARLATT, <i>Chief</i> .
<i>Grain Futures Administration</i> .....	J. W. T. DUVEL, <i>Chief</i> .
<i>Food, Drug, and Insecticide Administration</i> ....	WALTER G. CAMPBELL, <i>Director of Regulatory Work, in Charge</i> .
<i>Office of Experiment Stations</i> .....	E. W. ALLEN, <i>Chief</i> .
<i>Office of Cooperative Extension Work</i> .....	C. B. SMITH, <i>Chief</i> .
<i>Library</i> .....	CLARIBEL R. BARNETT, <i>Librarian</i> .

This bulletin is a contribution from

<i>Bureau of Animal Industry</i> .....	JOHN R. MOHLER, <i>Chief</i> .
<i>Animal Husbandry Division</i> .....	E. W. SHEETS, <i>Chief</i> .

13

ADDITIONAL COPIES  
OF THIS PUBLICATION MAY BE PROCURED FROM  
THE SUPERINTENDENT OF DOCUMENTS  
U. S. GOVERNMENT PRINTING OFFICE  
WASHINGTON, D. C.  
AT  
5 CENTS PER COPY  
▽



